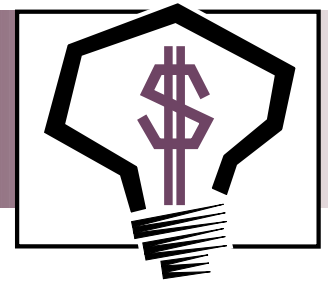


# INVENTIONS & INNOVATION

## Success Story



## AUXILIARY POWER UNIT OFFERS POWERFUL SAVINGS

### BENEFITS

- Argonne National Laboratory estimates the potential to save 5% of energy used by heavy long-haul trucks
- Meets all the needs of drivers and equipment while cutting fuel use at idle from 1 gallon to .2 gallon per hour
- Installation on 25% of heavy trucks that idle daily would save 70 million gallons of diesel fuel per year
- Prolongs truck engine life and cuts maintenance costs by reducing wear and tear that occurs through excessive or continuous idling
- Easy to retrofit and integrates seamlessly with existing vehicle systems
- Offers reliability due to fabrication with easily accessible, off-the-shelf, high-quality components and hardware
- Cuts NO<sub>x</sub> emissions by 69%, CO by 89%, and CO<sub>2</sub> by 88% per year  
1830 hours of idling eliminated per year

"We care most about the main engine life. Every new vehicle put into long-haul service is equipped with Pony Pack."

— Pete Ballard,  
Maintenance Director  
Ozinga Transportation



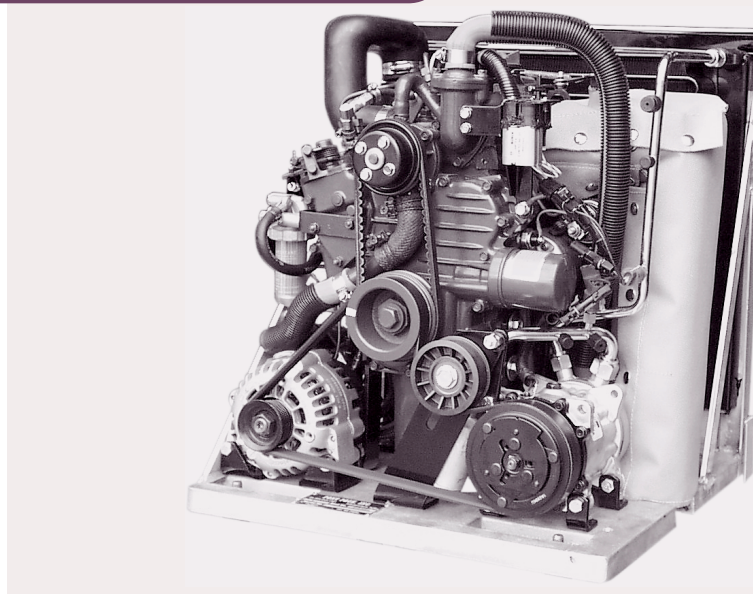
### PONY PACK SYSTEM REDUCES ENERGY USE, POLLUTION, AND FUEL COSTS

Almost 2 million Class 8 heavy trucks deliver essential goods throughout the United States each year. Nearly half a million of these heavy trucks travel more than 200 miles per day, and more than 300,000 of them will be idling their engines an average of 6 hours each day. Argonne National Laboratory has estimated that long-haul trucks use 570 million gallons of fuel annually just standing still, and a heavy truck will typically have its engine idling almost 1900 hours per year.

Idling occurs because power is needed to operate truck equipment such as lift gates, cranes, and car carrier ramps, or because drivers at rest need to maintain power for lights, appliances, communication gear, and air conditioning or heating for the cab and sleeping area. Truck drivers also run their truck engines to keep the batteries charged and the engines warm for easier restarting, especially on cold winter days and nights.

While the idling engine maintains a comfortable environment for drivers, it creates unnecessary waste. Constant running of high horsepower engines at low RPM combusts fuel incompletely. Besides wasting fuel during downtimes, the poor combustion gives off 10,397 grams of CO<sub>2</sub> per hour when the truck is not on the road. In addition, continual engine operation at low speed causes twice the wear on internal parts compared to road speed RPM, dramatically increasing maintenance costs and shortening engine life.

#### PONY PACK AUXILIARY POWER UNIT



PIX09172 Photo courtesy of Pony Pack, Inc.

While they cut operation costs, increase engine life, lower maintenance costs, and improve driver comfort, Pony Pack Auxiliary Power Units can also eliminate between 70 to 90% of diesel emissions produced during long periods of engine idling at rest stops.

## Solution

Rex Greer, President of Pony Pack, Inc., identified the need to cut down on wasteful and costly truck engine idling, but was unable to find a cost-effective and efficient 12-volt auxiliary power unit on the market. With the help of a grant from the Inventions and Innovation Program in the U.S. Department of Energy's Office of Industrial Technologies, Pony Pack, Inc., designed and tested an auxiliary power unit that maintains cab power while the main engine is not operating. The patented auxiliary power unit takes fuel from the existing truck fuel tank to provide heating and air conditioning for the cab and sleeper, to generate electricity to keep the battery charged, and to furnish hot water to keep the vehicle's engine warm.

The Pony Pack consists of a two-cylinder diesel engine, a 105-ampere direct-current alternator, a heat exchanger, and an air conditioning compressor and condenser in a unit that mounts on 24 inches of frame rail space and weighs only 300 pounds installed. The unit also serves as a back up if the main engine alternator or air conditioning compressor fails. The Pony Pack's smaller size and energy-efficient operation consumes 5 times less diesel fuel than an idling truck engine performing the same functions. It also runs so efficiently because its 10.5 horsepower engine operates at an optimum RPM and load.

## Results

The first commercial Pony Pack Auxiliary Power Unit was introduced in 1988. The product was fully commercialized in 1992, and more than 2000 units have been installed in the United States. Payback time for the auxiliary power units depends on individual use and varies between 9 and 24 months.

Pony Pack produces its auxiliary power units in Albuquerque, New Mexico, and ships them to dealers and installers all over the United States. The installation manual is written so that any facility capable of working on heavy-duty trucks can install the unit in approximately 20 to 24 labor hours. The units are sold through truck dealers and manufacturers. One major truck manufacturer now offers Pony Pack as a factory-installed option. In addition to being used in the long-haul trucking industry, the units can be used in other large engine applications, such as in military vehicles, industrial equipment, recreational vehicles, ambulances, buses, and locomotives. Employing 15 people, Pony Pack, Inc., now has annual sales that exceed \$1 million and sales have been growing about 10 to 15% per year.

## Sample Savings

Based on industry average idle times, Pony Pack, Inc., has estimated that annual fuel savings can amount to \$4,391, with wear and maintenance savings of an additional \$927. Customer testimonials verify the performance:

"After 6 years with one of the first ten Pony Paks ever installed, I wouldn't own a truck without one."

—J.R. Banister, Owner-Operator for Inway (1995)

"In 3.3 years, we had 10,056 run hours (75,585 gallons of diesel, \$95,000) on the main engine of which 971 hours (1,020 gallons, \$1300) were idling the main. During that time, Pony Pack avoided more main idling of 5,517 hours and consumed only 690 gallons. We probably would have idled the main engine only an additional 4,000 hours (4,200 gallons and \$5,300 saved). We've stretched main oil from every 10,000 to every 15,000 miles, reducing the changes from 49 to 32 and saving \$3,400. During service at 500,000 miles, we pulled a rod bearing and found no wear, saving \$4,500 on repairs. We sleep soundly without fumes and noise, so we're prepared to drive safely."

—Chuck and Kay Hersey, Owner-Operators (2000)

## Current Incentives

Oregon State Energy Tax Credits — <http://www.energy.state.or.us/txfcrdts.htm> (applicable although not mentioned in the forms)

Contact your state or municipality for rebates offered.



The Inventions and Innovation Program works with inventors of energy-related technologies to establish technical performance and conduct early development. Ideas that have significant energy savings impact and market potential are chosen for financial assistance through a competitive solicitation process. Technical guidance and commercialization support are also extended to successful applicants.

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For more information, see the paper *Technology Options to Reduce Truck Idling*, by L. Gaines et al.  
[www.transportation.anl.gov/ttrdc/publications/papers\\_reports/gaines/index.htm](http://www.transportation.anl.gov/ttrdc/publications/papers_reports/gaines/index.htm)

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